

## **REMARKS**

Claims 1-23 and 44-70 are pending. A clean copy of the claims as amended herein is attached for the Examiner's convenience.

### **I. Rejections Over the Prior Art:**

In responding to the Examiner's prior art rejections, Applicant here only justifies the patentability of the independent claims (1, 11, 44, and 56). As the Examiner will appreciate, should these independent claims be patentable over the prior art, narrower dependent claims would also necessarily be patentable. Accordingly, Applicant does not separately discuss the patentability of the dependent claims, although it reserves the right to do so at a later time if necessary.

Claims 1 and 11 have been rejected as anticipated (35 U.S.C. § 102(b)) by USP 6,538,734 ("Powell").

Claims 44 and 56 have been rejected as obvious (35 U.S.C. § 103) given Powell in combination with an article, A.D. Kuypers et al., "Emission Spectroscopy and Actinometry in a Magnetized Low Pressure Radio Frequency Discharge," J. Vac. Sci. Tech., No. A 8 (5), pg. 3736-3745 (Sept/Oct 1990) ("Kuypers").

#### **Claims 1 and 11**

Claims 1 and 11 both recite a "plasma chamber" coupleable to (claim 1) or coupled to (claim 11) a "processing chamber." The Examiner correctly appreciates that the claimed "processing chamber" corresponds to Powell's "reaction chamber 101" (Fig. 1), and that the claimed "plasma chamber" corresponds to Powell's "excitation chamber 105."

Claims 1 and 11 both also recite that the “plasma chamber” has “at least one reference gas input port for receiving at least one reference gas.” Thus, to anticipate, Powell’s “excitation chamber 105” would need to have “at least one reference gas input port for receiving at least one reference gas.”

But, contrary to the Examiner’s understanding, Powell does not disclose this limitation. Instead, Powell discloses the introduction of a reference gas into his “reaction chamber,” i.e., akin to the claimed “processing chamber.” Powell does not disclose “at least one reference gas inlet port for receiving at least one reference gas” to his “excitation chamber,” i.e. akin to the claimed “plasma chamber.”

The relevant section of Powell’s written description comprises the text accompanying Figure 10. This text, quoted below, is clear that Powell discloses and suggests only the introduction of a reference gas into his reaction chamber 101, and not directly into the excitation chamber 105:

FIG. 10 depicts a process in which a reference gas is used to determine quantitatively the amount of fluorine in an exhaust stream. The peaks analyzed were fluorine at 704 nm and argon at 750 nm. ***The data in this figure are from tests run on a Lam XL etcher, using gas flow but no plasma discharge in the reaction chamber. A gas flow including 500 sccm argon was initiated.*** Varying quantities of CF<sub>4</sub> gas, from 1 to 20 sccm, were introduced. . . .

Powell, col. 7, ll. 31-38. Clearly, the bolded sentences make clear that argon (i.e., the reference gas) was introduced into the Lam XL etcher (i.e., the reaction chamber). If this disclosure from the written description of Powell is not clear enough, Powell’s claims make absolutely explicit that he discloses introduction of the reference gas into his reaction chamber (and not his excitation chamber):

“Claim 71. A method of obtaining a quantitative measure of an unknown flow gas having a known spectral peak, comprising: ***introducing a known flow of reference gas having a known spectral peak into a reaction chamber;*** sampling gas outside a reaction chamber

that has passed through the reaction chamber, exciting the sampled gas to emit radiation; detecting in real time wave bands, corresponding to the known spectral peaks of the known flow reference gas and the unknown flow gas, from the emitted radiation; and determining a quantitative measure of the unknown flow gas from of the detected wave bands.

72. The method of claim 71, wherein the reference gas is argon.”

In short, Powell does not disclose what Applicant claims. He does not disclose the claimed “plasma chamber” having “at least one reference gas input port for receiving at least one reference gas.” Instead, any reference gas in Powell flows into his “reaction chamber,” which is akin to the claimed “processing chamber,” a concept not claimed. Thus, the Examiner’s rejection of claims 1 and 11, and their dependent claims, is traversed.

Claims 44 and 56

Claims 44 ad 56 both recite *“at least one probe for measuring the energy of at least one species in the plasma.”* The Examiner acknowledges that this limitation is not disclosed in Powell in any way, shape, or form. However, the Examiner cites to Kuypers as disclosing a plasma probe, and notes that the same is disclosed in Kuypers as an alternative means to actinometry for interpreting optical measurements.

However, the Examiner neglects to notice or mention that the cited disclosure in Kuypers actually teaches away from the use of a probe. Specifically, in the Actinometry section of Kuypers, Kuypers notes that *“(Langmuir probe measurements in reactive plasmas have not been performed in this study because they are less reliable.)”* Kuypers at 3742. It is basic patent law that two references cannot be combined in an obviousness rejection when the references teach away from the claimed concept. See MPEP § 2145(X)(D).

Even if one looks beyond the criticism of the use of probes in Kuypers, the fact remains that nothing in Kuypers suggests using probes in the context of Powell, i.e., in the context of

analyzing agents in a plasma chamber coupled downstream to a processing chamber. When such a motivation to combine the reference is lacking, it becomes clear that the Examiner has merely picked the probe limitation from Kuypers to reconstruct Applicant's invention in hindsight, which is impermissible.

Therefore, Applicant traverses the rejection of claims 44 and 56 on the ground of obviousness, and requests this rejection to be lifted.

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Based on the above remarks, Applicant respectfully submits that the pending claims are allowable, and requests that a Notice of Allowance issue for these claims.

Respectfully submitted,

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